

REMARKS

Applicants have considered the Non-Final Office Action mailed September 1, 2006, and respectfully request reconsideration of the application. After entry of the amendments, claims 1-3, 7-9, 11, and 13-30 are pending in the application. Claims 4-6, 10, and 12 have been canceled. Claims 7 and 13-29 have been withdrawn from consideration. New claim 30 has been added. Claims 1-3, 8, 9, and 11 have been rejected.

Applicants add new claim 30, which recites a curable composition comprising a) at least one epoxy resin, b) at least one reactive liquid polymer comprising a carboxyl-terminated butadiene-acrylonitrile copolymer, and c) at least one reaction product of an epoxy resin and a reactive liquid polymer, wherein the reactive liquid polymer of (b) has a Brookfield viscosity of from about 500 cps to about 2,500,000 cps at 25°C, and the epoxy resin of (c) comprises a diglycidyl ether of a bisphenol compound. The Brookfield viscosity feature finds support, for example, in the originally filed specification in claim 8 and at page 9, lines 16-17.

Rejections under 35 U.S.C. § 112

The Examiner rejected claims 1-3, 8, 9, and 11 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner contends that there is no support for the carboxyl-terminated butadiene-acrylonitrile copolymer limited to a "liquid at ambient temperature." Specifically, the Examiner contends that there is no description of the individual copolymer as being liquid at ambient temperature and that the specification does not indicate the phase in which the components are blended. Applicants respectfully traverse this rejection.

To satisfy the written description requirement, the specification must only convey – with reasonable clarity – to a person skilled in the art that the inventor possessed the claimed invention as of the filing date. (M.P.E.P. 2163(I), 2163.02 (Rev. 5, Aug. 2006).) Further, the claimed subject matter does not have to be described literally to satisfy the written description requirement. (M.P.E.P. 2163.02.) That is, there is no *in haec verba* requirement. (Id.) Rather, the specification must only reasonably convey that the inventor possessed the claimed subject matter.

The specification supports a carboxyl-terminated butadiene-acrylonitrile copolymer that is liquid at ambient temperature. The specification clearly states that the components of the curable composition are combined by blending at ambient or slightly elevated temperatures. (Specification, page 17, lines 9-10.) The specification also describes that a reactive liquid polymer is a component in the curable composition. (See, e.g., Specification, page 7, line 28.) The specification discloses suitable reactive liquid polymers (Specification, pages 8-14) including liquid polymer comprising a carboxyl-terminated butadiene-acrylonitrile copolymer. (Specification, page 10, lines 13-17.) Consequently, the specification reasonably conveys that the polymer in the blend can be a liquid at room temperature. That is, even though it may not explicitly describe the individual copolymer as being liquid at ambient temperature, the specification reasonably conveys to a person skilled in the art that the Applicants possessed what is now claimed. Applicants request that the rejection be withdrawn.

Claims 1-3, 8, 9, and 11 have been rejected under 35 U.S.C. §112, first paragraph, as not complying with the enablement requirement. The Examiner relies on the reasoning presented in the non-final rejection mailed January 12, 2006, the final rejection, and the advisory action. Specifically, the Examiner states that an epoxy resin must contain at least two epoxy groups. Applicants respectfully traverse the rejection.

The evidence that Applicant submitted in responses to previous Office Actions is sufficient to overcome the Examiner's assertion that epoxy resins require at least two epoxy groups.¹ The Concise Encyclopedia of Chemical Technology, Kirk-Othmer, 4th Ed. 1999, for example, describes an epoxy resin as being "characterized by the presence of a three-dimensional ring known as the epoxy, epoxide, oxirane, or ethoxyline group" (emphasis added). There is no stated requirement for more than one epoxy group. Further, the definition of epoxy resin to which the Examiner refers in The Handbook of Epoxy Resins specifically states that "*For the purpose of this book, an epoxy resin is defined as any molecule containing more than one α -epoxy group...*" (emphasis added). At the least, these descriptions indicate that it is not a generally accepted convention in the art that an epoxy resin would require at least two epoxy groups.

¹ Copies of the discussed documents are not resubmitted with this response.

Additionally, Hawley's Condensed Chemical Dictionary, Twelfth Edition, 1993, does not define an epoxy resin as requiring at least two epoxy groups. Hawley's states that an "epoxy resin" is a resin that is "based on the reactivity of the epoxide group." Using the singular term "epoxide group" indicates that two or more epoxy groups are not required for an epoxy resin. Nothing in the definitions for "epoxide" or "epoxy resin" requires at least two epoxy groups.

Further, the portions from the Hawley's definition relied on by the Examiner do not undermine Applicants evidence. The Examiner stated that "[t]he term epoxy resin is defined in the submitted Hawley's Condensed Chemical Dictionary (page 468, second column) as having 'glycidyl ether structures' and the epoxide group structure 'in the terminal positions,' thereby confirming the presence of at least two epoxy groups per molecule." (Advisory Action, July 10, 2006, page 2.) When these statements are viewed in full context, however, they do not support the proposition that all epoxy resins require at least two epoxy groups. Specifically, Hawley's states that:

One type [of epoxy resin] is made from epichlorohydrin and bisphenol A. Aliphatic polyols such as glycerol may be used instead of the aromatic bisphenol A. Molecules of this type have glycidyl ether structures... in the terminal positions, have many hydroxyl groups, and cure readily with amines.

(Emphasis added, structure omitted.)

That is, the Hawley's definition merely indicates that an example of an epoxy resin is one made from epichlorohydrin and bisphenol A (or aliphatic polyols), and that "molecules of this type," i.e., molecules of epichlorohydrin and bisphenol A (or aliphatic polyols), have terminal glycidyl ethers. This statement does not indicate that all epoxy resins must have at least two epoxy groups.

Moreover, even if the art recognized definition required an epoxy resin to have at least two epoxy groups, which Applicants have shown it does not, Applicants can act as their own lexicographer and include materials outside that definition. (M.P.E.P. 2111.01 (IV).) The specification states that a wide variety of commercially available epoxy resins can be used in the invention and then includes octadecylene oxide, epichlorohydrin, styrene oxides, vinylcyclohexene oxides and glycidyl methacrylate in a list of suitable examples. (Specification, page 6, lines 29-30 through page 7, lines 1-25.) Therefore,

the specification sets out with reasonable clarity that an epoxy resin could include these materials.

Thus, the evidence does not show that an epoxy resin requires as least two epoxy groups. Further, given that the specification indicates that "epoxy resin" can include the questioned materials, the Examiner has not shown that undue or unreasonable experimentation is required to practice the invention. Consequently, Applicants respectfully request that the rejection of claims 1-3, 8-9, and 11 under 35 U.S.C. §112, first paragraph, be withdrawn.

Rejection Under 35 U.S.C. § 103

The Examiner rejected claims 1-3, 8, 9, and 11 under 35 U.S.C. § 103(a) as being unpatentable over Minamisawa et al. (U.S. Patent No. 4,500,660) and Japanese Patent No. 64- 01-060679. The Examiner contends that it would have been obvious to formulate the compositions of Minamisawa and JP '679 "with the carboxy-terminated butadiene-acrylonitrile as a liquid at room temperature in order to facilitate blending of the components." (Office Action, September 1, 2006, page 4.) Applicants respectfully traverse this rejection.

In order to establish a prima facie case of obviousness, there must be (1) some suggestion or motivation, either in the references themselves or in the knowledge generally available to one skilled in the art, to modify the reference or to combine reference teachings, and (2) a reasonable expectation of success; further, the prior art references must teach or suggest all the claim limitations. (MPEP 2143.)

Minamisawa and JP '679 fail to teach all the claim limitations. In particular, neither Minamisawa nor JP '679 teach a curable composition employing at least one reactive liquid polymer comprising a carboxyl-terminated butadiene-acrylonitrile copolymer, which polymer is liquid at ambient temperature. Applicants have previously shown that the Nipol polymers disclosed by both Minamisawa and JP '679 are solids. Further, Minamisawa only discloses that suitable nitrile rubbers have a Mooney viscosity between 40 and 110 at 100°C. Thus, these references fail to teach or suggest using a carboxyl-terminated butadiene-acrylonitrile copolymer that is liquid at ambient temperature, and, therefore, fail to render the claims obvious.

The Examiner maintained the rejection under § 103 for reasons set forth in previous Office Actions. In a prior Office Action, the Examiner contended that it would be obvious to formulate the composition of Minamisawa and JP '679 "with a carboxyl-modified butadiene-acrylonitrile polymer having the Mooney viscosity disclosed in Minamisawa et al., thereby indicating a liquid state, in order to facilitate the processability." (Office Action, April 21, 2006, pages 3-4.) The Examiner now contends that Minamisawa and JP '679 do not confine their polymers to any phase and that these references not only indicate a liquid state, but indicate a liquid at room temperature. (Office Action, September 1, 2006, page 4.)

Applicants respectfully disagree with the Examiner's contention. Even if Minamisawa and JP '679 do not confine their copolymers to a particular phase, it would still not be obvious to formulate the compositions of Minamisawa and JP '679 with a carboxy-terminated butadiene-acrylonitrile that is liquid at room temperature in order to facilitate blending. First, the Mooney viscosities disclosed in Minamisawa are measured at 100°C, which is well above ambient temperature. Second, as described above, the references only disclose Nipol polymers, which are solids. Thus, contrary to the Examiner's assertion, Minamisawa and JP '679 teach that the composition would have to be formed by blending their (solid) components at an elevated temperature. Therefore, it is only through prohibited hindsight in view of Applicants' disclosure that a person skilled in the art would arrive at the present claims. Consequently, the combination of Minamisawa and JP '679 do not render the claims obvious, and Applicants request that the rejection under § 103 (a) be withdrawn.

New Claim 30

Applicants submit that new claim 30 is also patentable for at least the reasons discussed above. Applicants also note that the Examiner has stated that favorable consideration would be given to such a claim.

CONCLUSION

In view of the foregoing remarks and amendment, Applicants respectfully request reconsideration and a timely issuance of a notice of allowance for claims 1-3, 8-9, 11, and 30.

In the event any fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to our Deposit Account No. 18-0988 under Attorney Docket No. **BFGRP0313USB**. In the event an extension of time is needed to make the filing of this paper timely and no separate petition is attached, please consider this a petition for the requisite extension and charge the fee to our Deposit Account No. 18-0988.

In the event there are issues the Examiner would like to discuss with the Applicants' attorney, he is invited to contact the undersigned by phone.

Respectfully submitted,

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